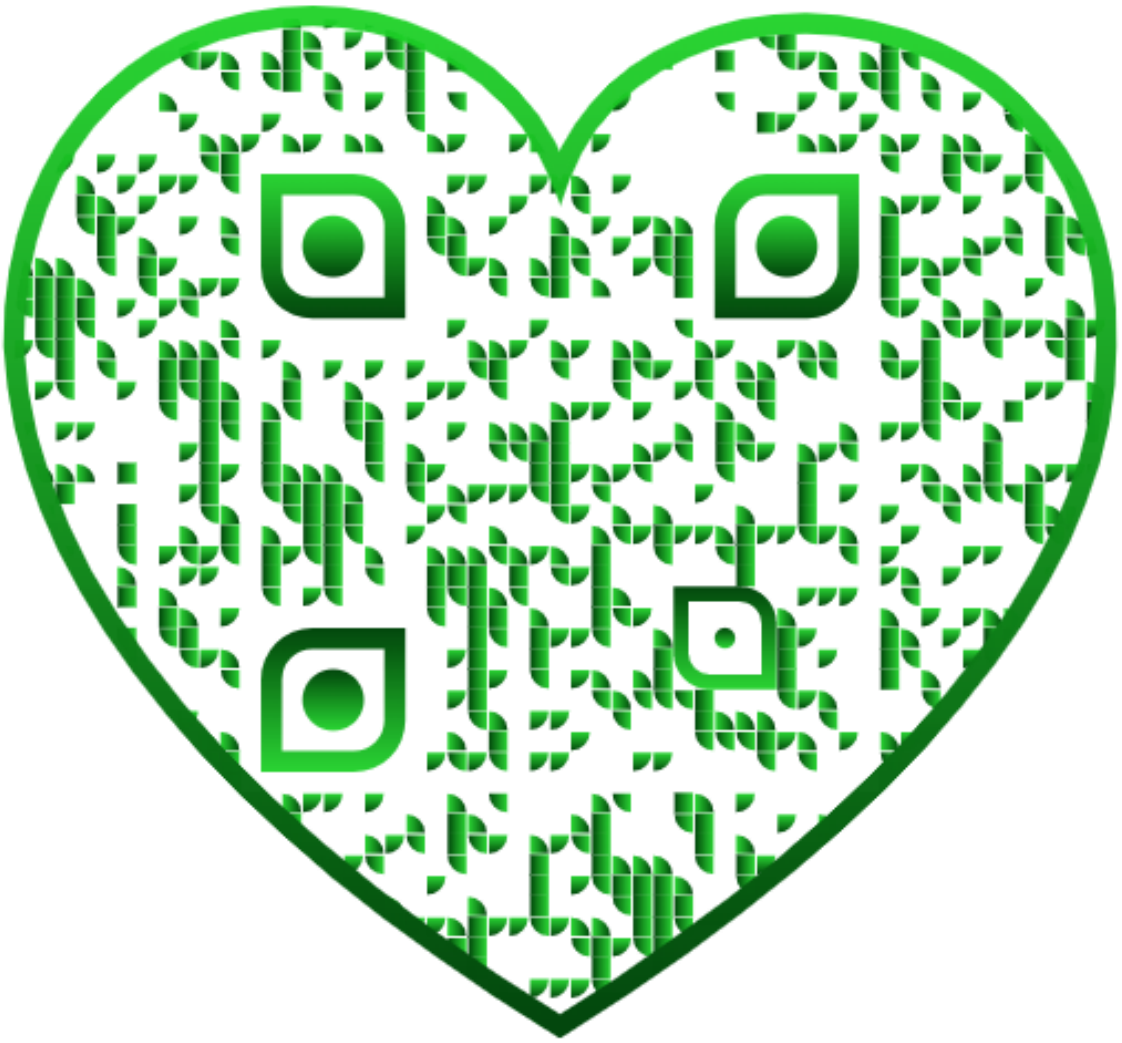
بسم الله الرحمن الرحيم

Osteoarthritis as Chronic Pain(16-5-2024)

د. سعيد عبد الله بامشموس

استشاري اول لأمراض وجراحه العظام والكسور والمفاصل



Definition

*"**Osteoarthritis**" means inflammation of the joint, while*

*"**Osteoarthrosis**" means degeneration of the joint.*

Symptoms & Sign

- Pain (in rest more serious).
- Swelling.
- Decreased range of motion.
- Mechanical affect.
- Crepitus.
- Locking joint.
- Catching.

Incidence

- The global incidence OA was 203 per 10,000 person-years.
- 25% to 30% of 45 years had OA.

- More than 85% of individuals older than 65 years have Radiographically detectable Osteoarthritis.

Chang RW, et al : 2010

- There are no data describing the relationship between premature Arthrosis of the Knee and patients' activity levels.
- Direct Medical costs reach **$65 billion annually**.
- 1 million Knee and Hip replacements are completed each year

Incidence

- ✓ Direct costs included **all medical** costs for surgical and nonsurgical treatment of Osteoarthritis.
- ✓ Indirect costs were related to lost wages due to **an inability to work**, lower earnings, or receipt of **disability payments**
- ✓ Complications of Osteoarthritis is worsens over time, often resulting in **Chronic pain**.
- ✓ Joint pain and stiffness can become severe enough to make daily tasks difficult.
- ✓ **Depression** and **sleep disturbances** can result from the pain and disability of osteoarthritis

Incidence

- ✓ Research also shows that OA are almost three times more likely to develop Cardiovascular disease (CVD) or Heart failure than those without OA.
- ✓ Many studies have shown clearly that people with arthritis with the highest pain levels are the most likely to **be Anxious or Depressed**.
- ✓ About 1 in 5 US adults with arthritis has symptoms of Anxiety or Depression

Etiology

The etiology of Osteoarthritis is ***unclear***, but the process is a combination of

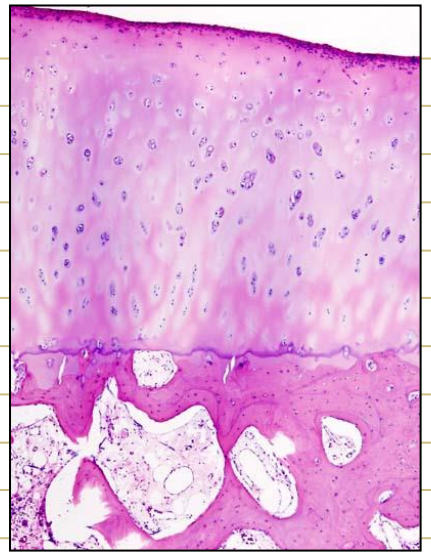
- *Qualitative changes*
- *Biologic changes*
- *Biomechanical changes.*

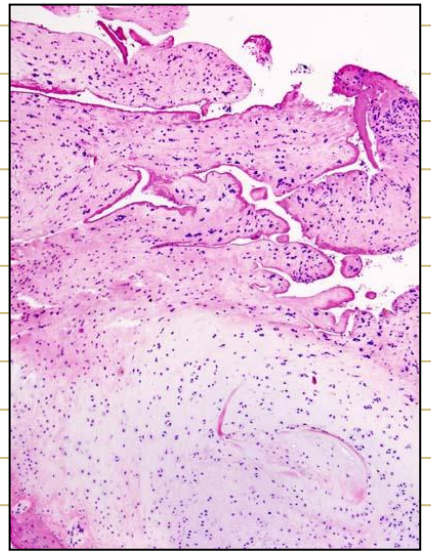
resulting in ***loss of biochemical homeostasis*** and subsequent ***biomechanical failure*** of the joint cartilage due to physical forces.

Histology

Osteoarthritis is characterized

- ✓ 1.Loss of integrity of articular cartilage,
- ✓ 2. Diffuse fraying
- ✓ 3. Fibrillation and
- ✓ 4. Hypertrophic changes in adjacent bone.





Pathophysiology

What happens when changes in normal Biomechanics?

- ✓ Neutral weight bearing distribution.
- ✓ *Normal alignment* of musculoskeletal structures.
- ✓ *Muscles action* will change.

Pathophysiology

Negative adaptation of musculoskeletal structures and Insufficiency of the function .

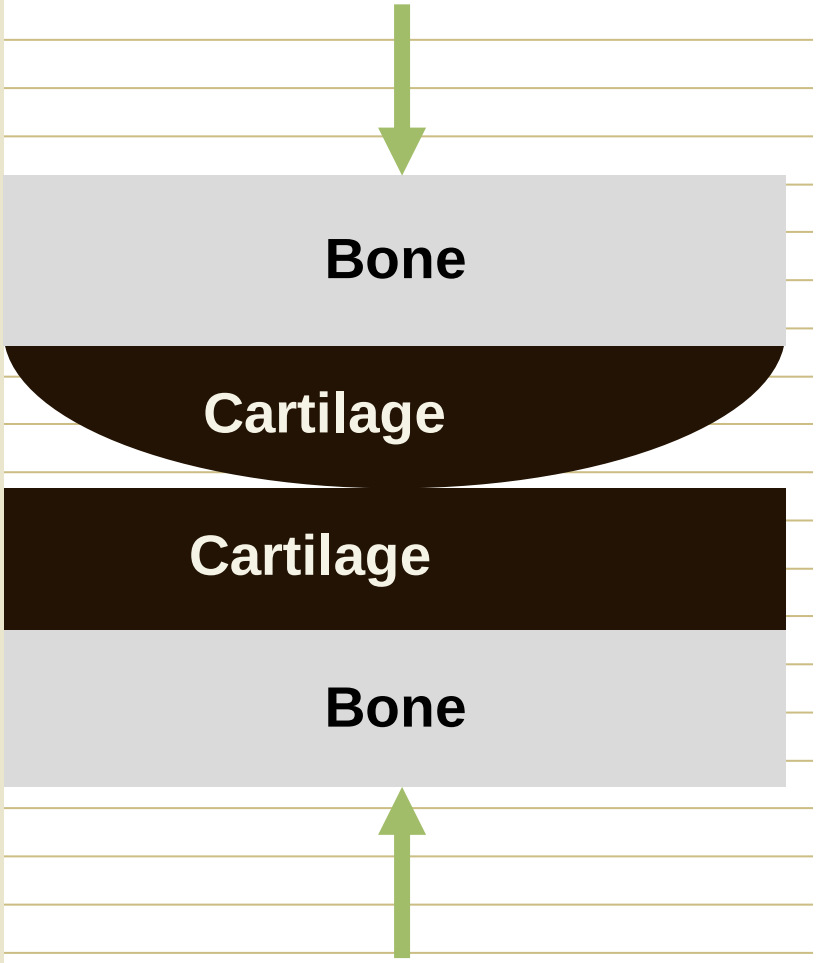
- Decreasing elasticity and flexibility.
- Hypomobility.
- No weight distribution normally.
- Joint and bones stressing and over loads.
- Starting pain.

How does cartilage work?

- 80% water in “tight sponge” of solid matrix.
- Water does not squeeze out: → takes most of load
- *Water can <u>do</u>*

✓ *<u>self-lubricating</u>*

✓ *<u>self-repairing</u>*



Classification

Ideally, the description of Osteoarthritis should include

- The size,
- Depth,
- Location,
- Flexion angle
- Contact zone,
- Condition of the opposing articular surface.

Primary Osteoarthritis

Is a progressive "wear and tear" degenerative condition that increases in prevalence nonlinearly with age after 50 years.

Secondary ***Osteoarthritis***

may occur much earlier, usually after

1) Significant injury resulting in either (Varus or Valgus) Malalignment,

2) Intra-articular Fracture, or Infection

3) Ligamentous and Meniscal deficiency.

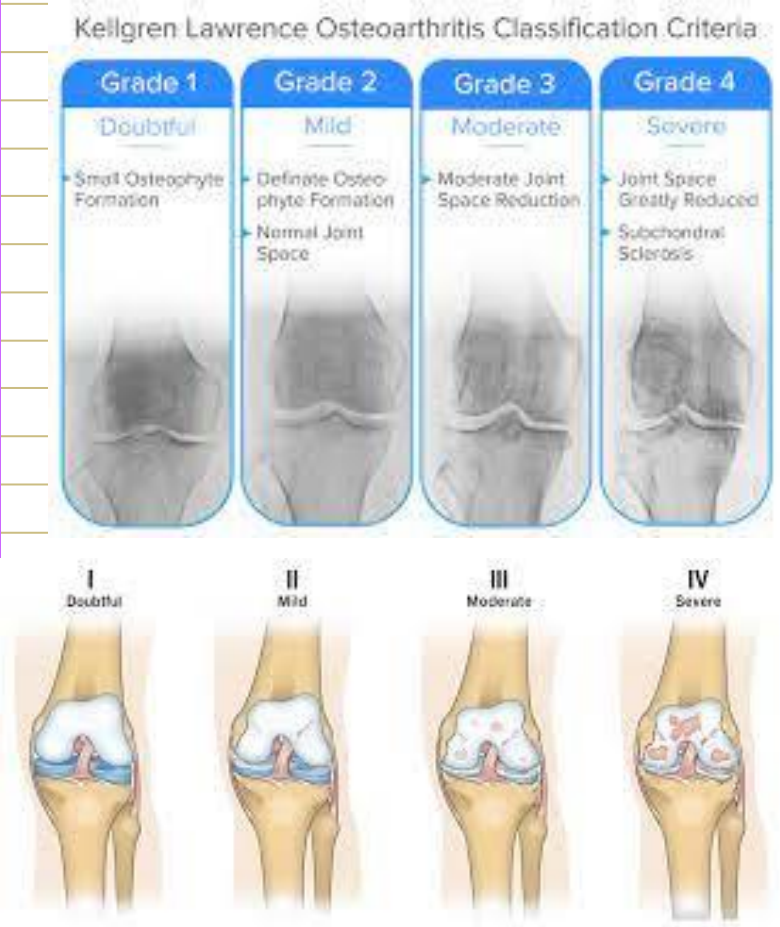
Classification Grade

1) *Grade 0* is normal articular cartilage.
2) *Grade I* characterized by softening and swelling of the articular cartilage.
3) *Grade II* has early fissuring that does not reach the subchondral bone less than 1cm.

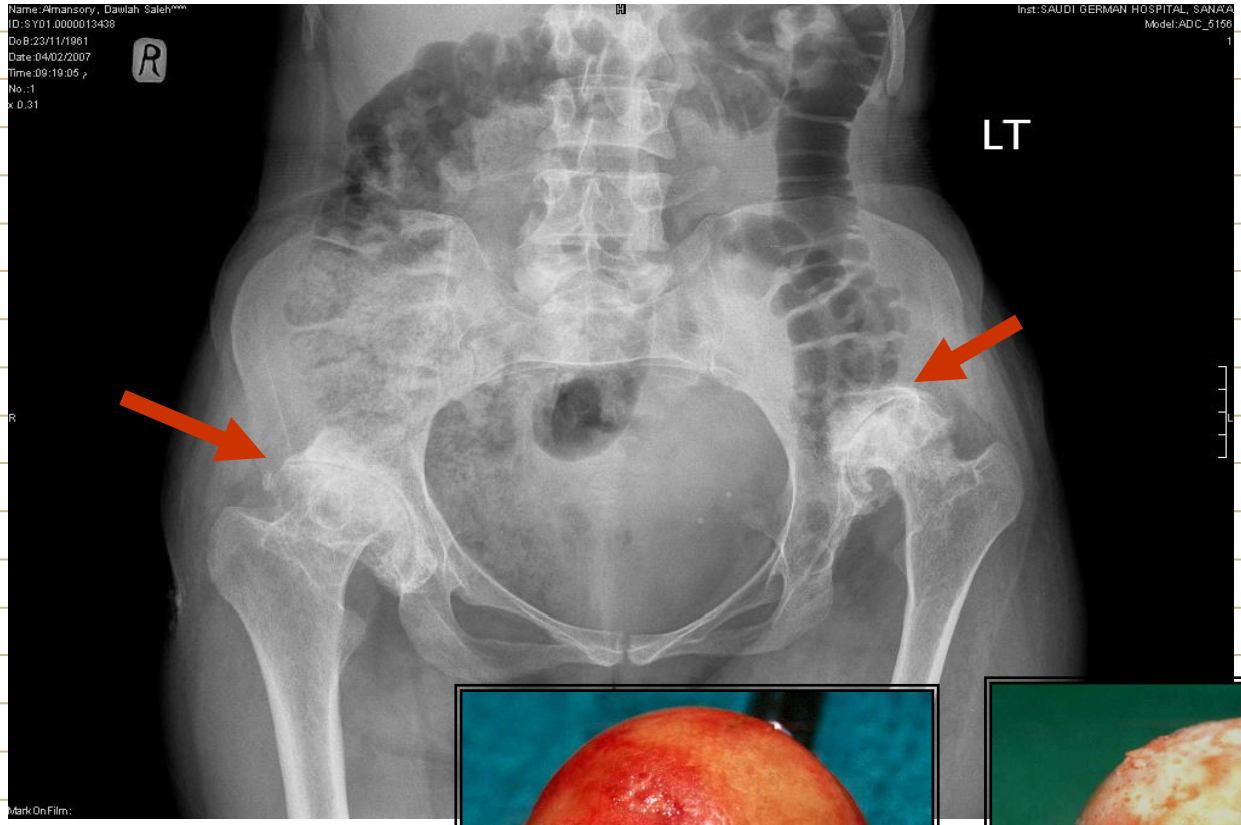
Classification

4) *Grade III* shows fissuring that reaches the subchondral bone but subchondral bone is not exposed and diameter greater than 1cm.

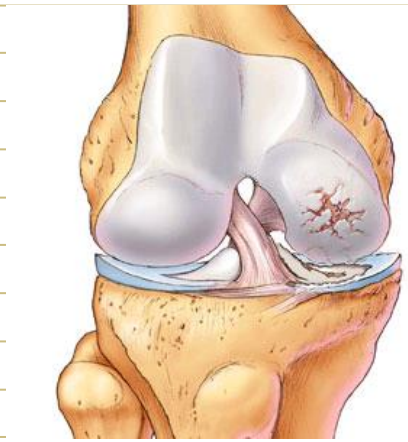
5) *Grade IV* shows exposed subchondral bone of any diameter.

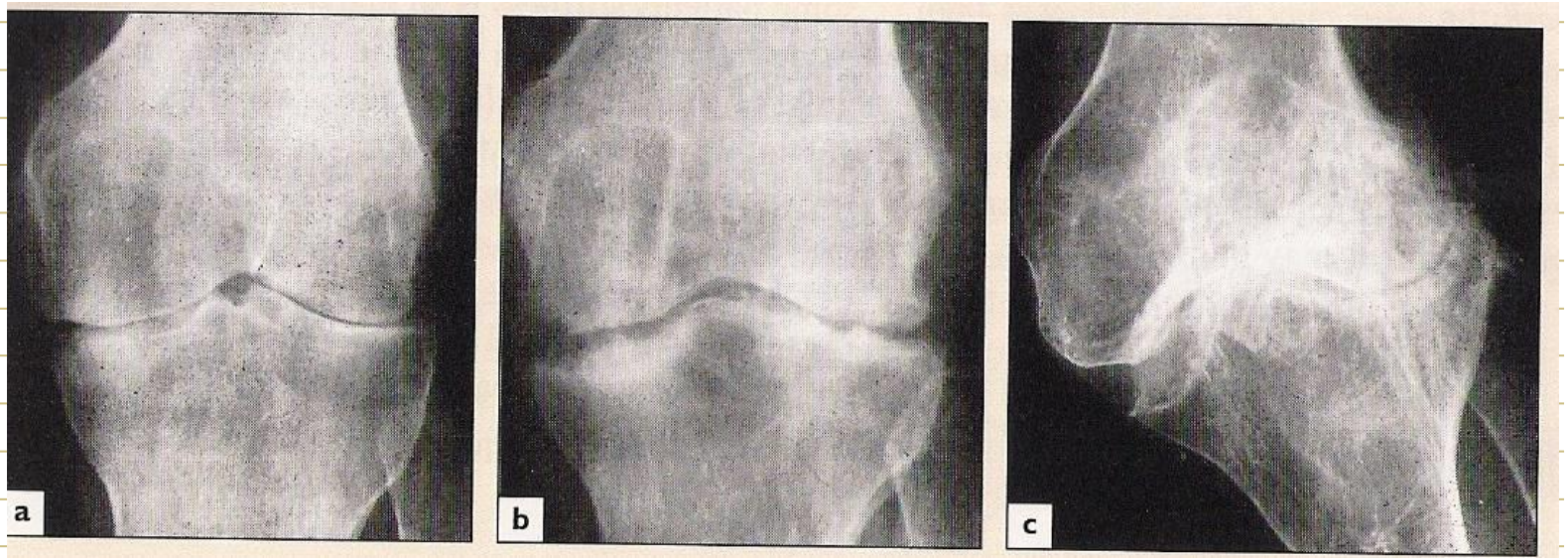


Coxarthrosis



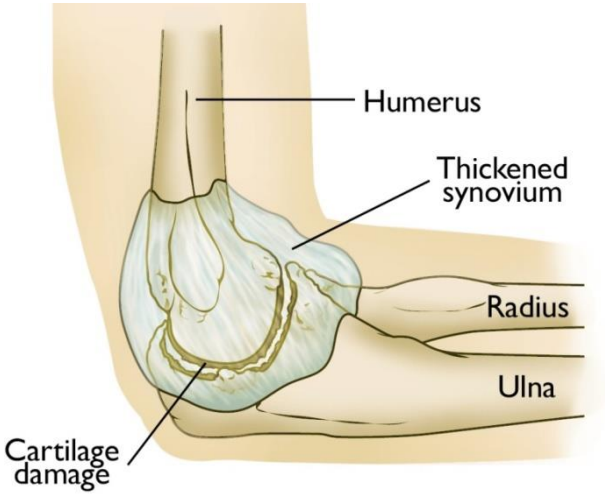
Gonarthrosis





SHOULDER OA

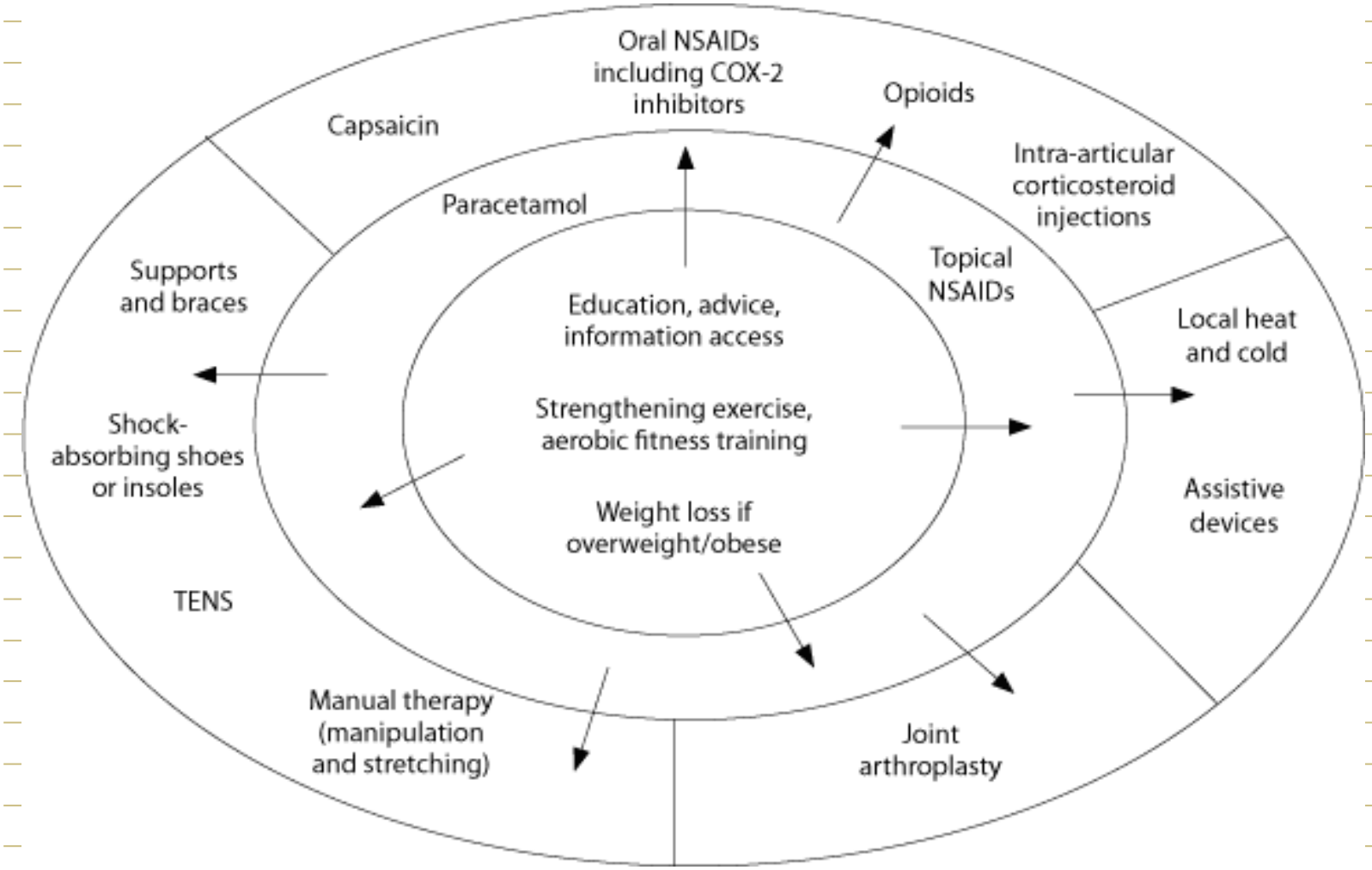
ELBOW OA


Humerus
Thickened synovium
Radius
Ulna
Cartilage damage

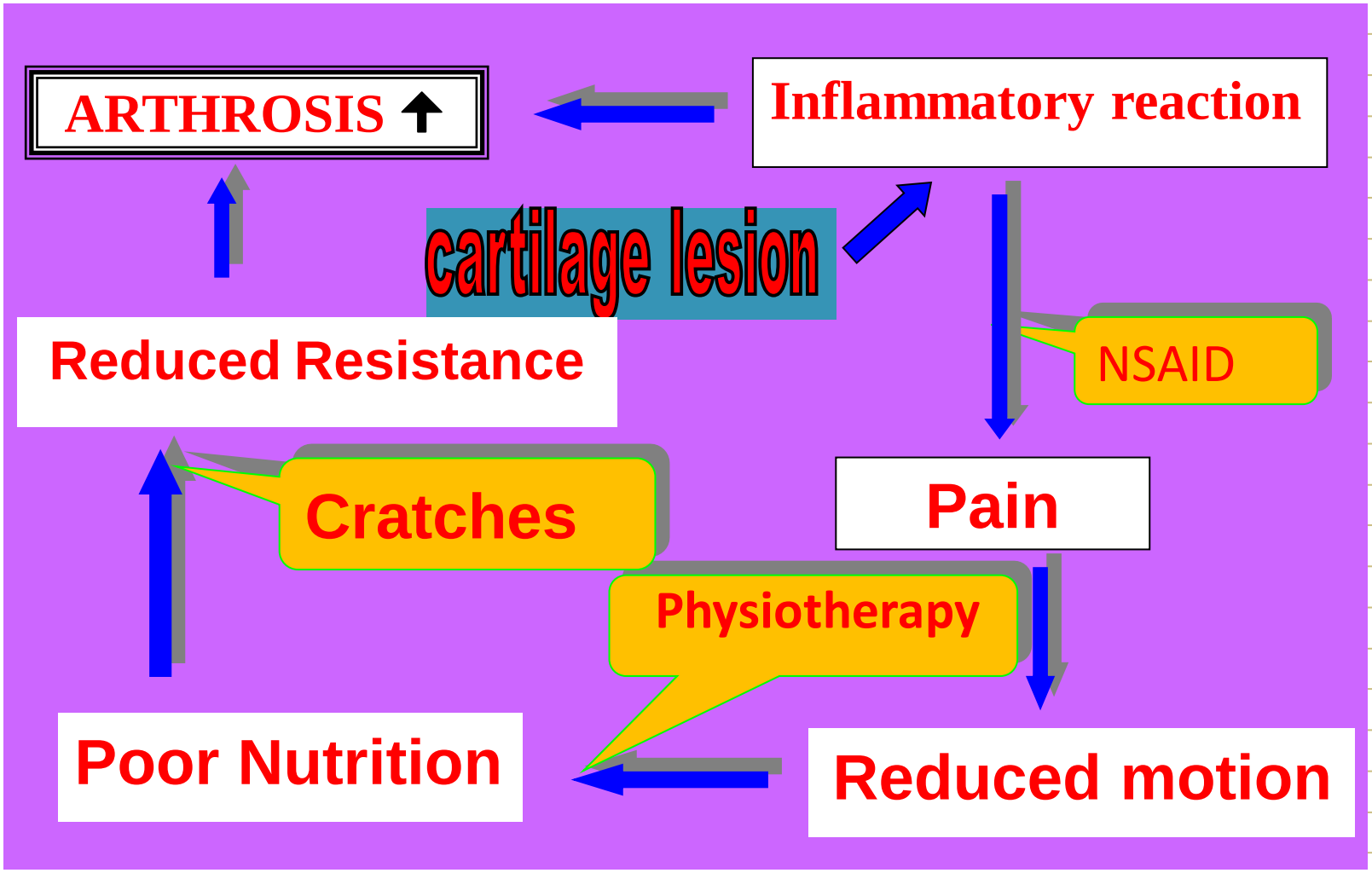
A
B

Management

THINK! Function- Function-Function



„Vicious Circle of Arthrosis“



Osteoarthraitis Means **Suffer**

A painful joint

- ✓ *Torture.*
- ✓ *Quality of life is reduced severely.*
- ✓ *Permanent handicap.*
- ✓ *Neediness!*

A. Nonsurgical treatment

- ✓ - Lifestyle modification,
- ✓ - Medical management,
- ✓ - Bracing,
- ✓ - Orthotics, and
- ✓ - Rehabilitation.

Lifestyle Modification

- ✓ Using high stools in lieu of prolonged standing,
- ✓ Avoiding high-impact activities, and
- ✓ Ensuring adequate **rest** may alleviate symptoms of activity-related pain and swelling.

Lifestyle Modification

- ✓ Running and jumping should be **avoided**,
- ✓ Low-impact activities, such as swimming and bicycling, are excellent recommendations.
- ✓ **Limiting squatting** and stair climbing reduces pain in patients with significant patellofemoral arthrosis.

Lifestyle Modification

- ✓ Patients can modify their employment.
- ✓ Adaptations in the home, such as raising the level of a chair or toilet seat, may become necessary for those with chronic symptomatic osteoarthritis of the knee.

Medical Treatment of Osteoarthrosis

a) Treatment of the **cause**

(e.g. reducing overweight, some metabolic disorders [e.g. Gout])

b) Symptomatic treatment

e.g. treatment of symptoms

(NSAIDs Analgesics)

Medical Treatment of Osteoarthrosis

- ✓ NSAIDs are the most effective oral medicines for OA. They include Ibuprofen (Motrin, Advil) Naproxen (Aleve) and Diclofenac (Voltaren, others). All work by blocking enzymes that cause pain and swelling.

- ✓ Paracetamol, in doses of as high as 4000 mg/day, is the first-line drug of choice for the management of the pain of OA
- ✓ Diacerein- A gold standard analgesic in management of osteoarthritis

Local injections

1) ***Corticosteroid*** Injection.

2) Visco supplementation Injectable (high-molecular weight solutions) supplement the reduced concentrations of hyaluronate found in patients with Osteoarthritis.

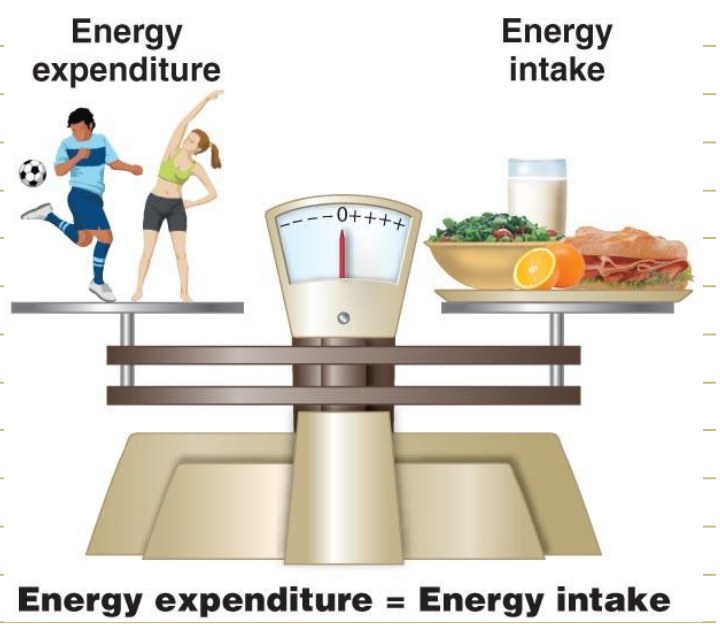
Physiotherapy Management

- ✓ Massage
- ✓ Aerobic exercise.
- ✓ Reduce lode to joint and muscle.
- ✓ Increase self efficacy.

Effect of exercise on body composition & weight control

Exercise increases/helps to:

- Energy output relative to input.
- Fat loss.
- Preserve lean tissue
- Prevent obesity.
- The impact of exercise on body composition decreases as the fat content decreases.



B. Indications for Surgery

1) Intolerable lifestyle changes.

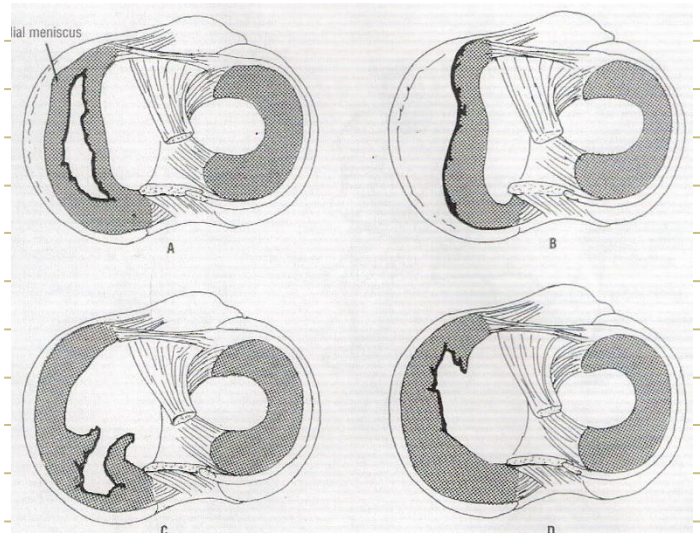
2) Poor response to non operative treatment.

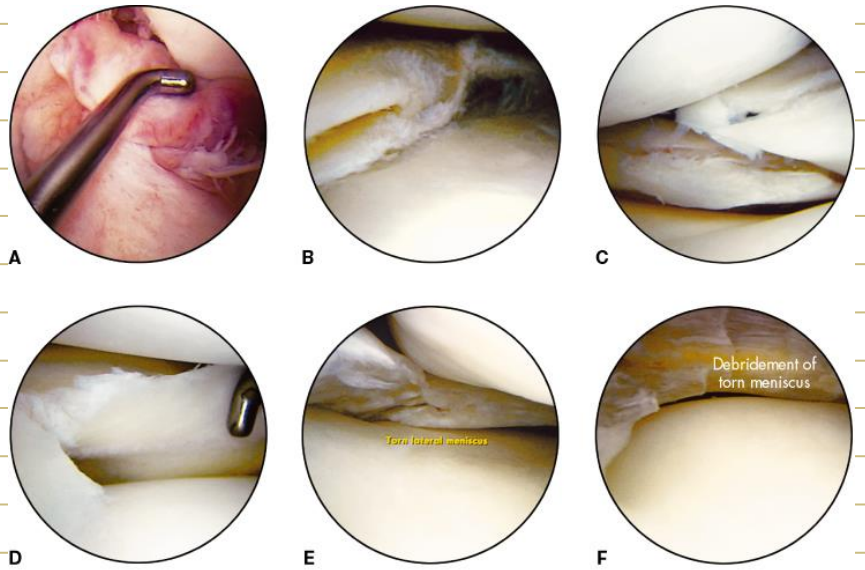
Possibilities of Operative Treatment

- ***Correction of mechanical axis*** (Femur & Tibia)
- ***Debridement‘ of the joint by Arthroscopy*** (knee-& ankle-joint, seldom hip joint)
- ***Osteotomy.***
- ***Meniscal transplantation***
- ***Articular cartilage restoration*** (allografts and autografts, chondrocyte mplantation***.***
- ***Arthrodesis*** (most done: ankle joint)
- ***Replacement*** (esp. hip, knee, shoulder)

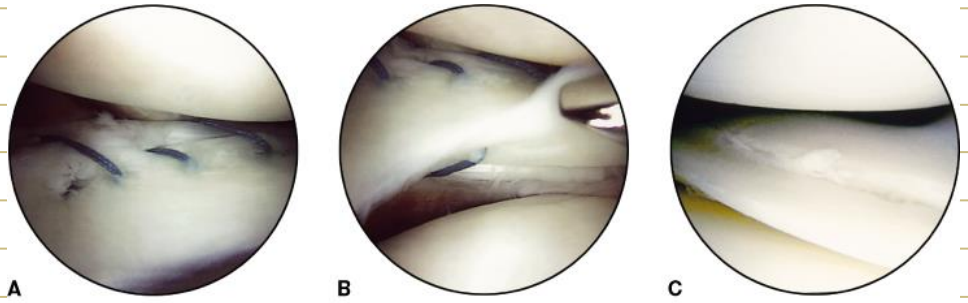
ARTHROSCOPY

MENISCUS LESIONS
MEDIAL &LATERAL



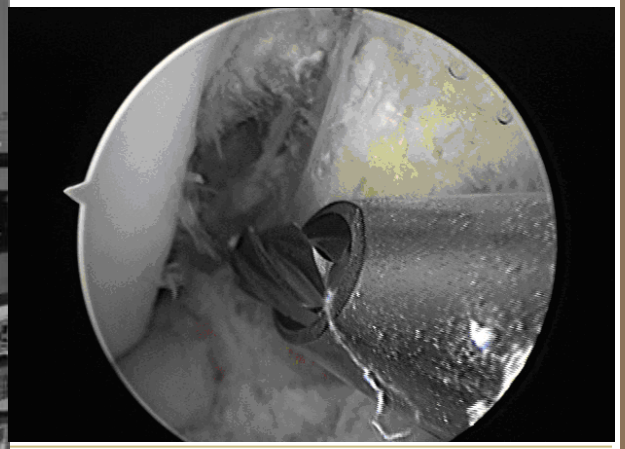


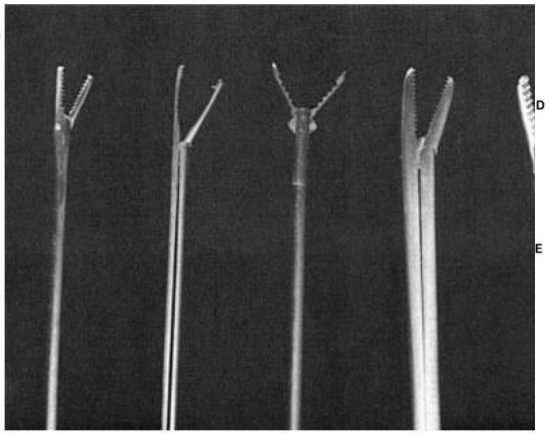
Mosby, Inc. items and derived items copyright © 2003, Mosby, Inc. All rights reserved.

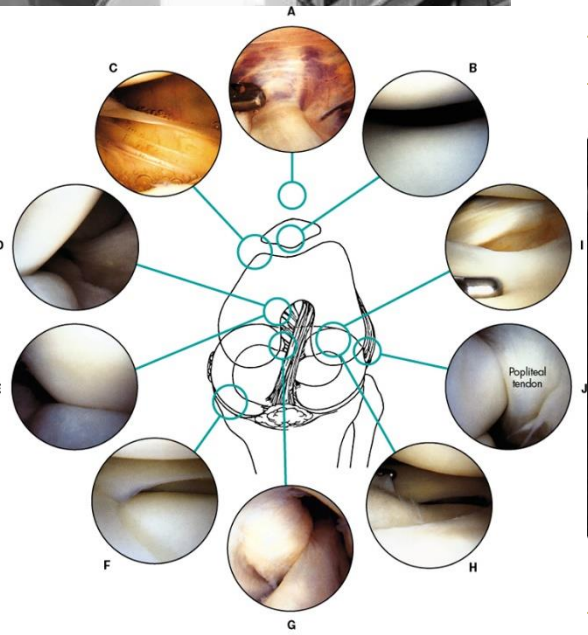


Mosby, Inc. items and derived items copyright © 2003, Mosby, Inc. All rights reserved.

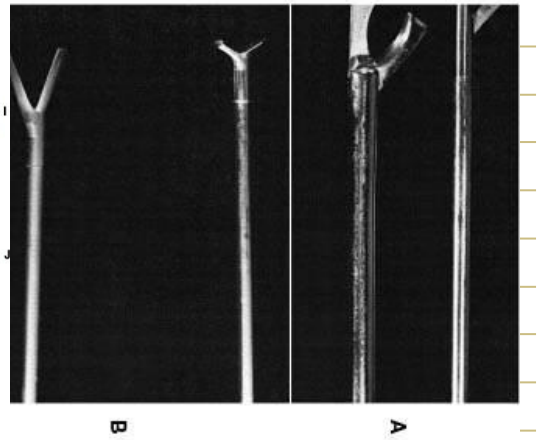
Mosby, Inc. items and derived items
copyright © 2003, Mosby, Inc. All rights reserved.







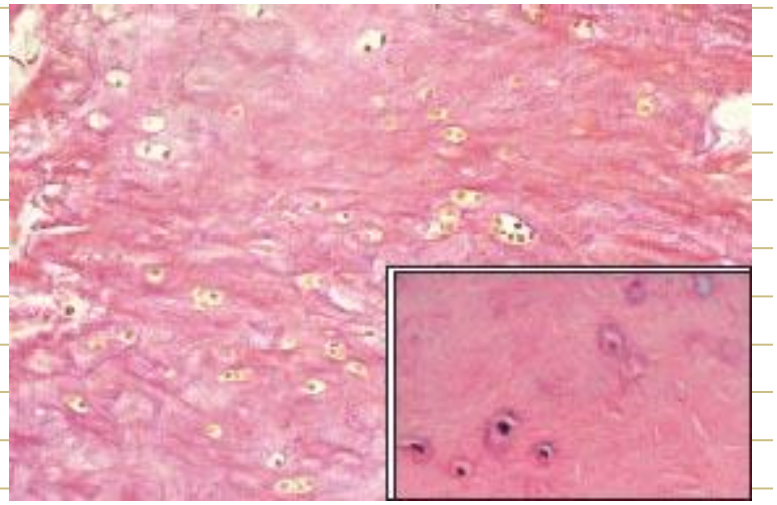
Mosby, Inc. items and derived items copyright © 2003, Mosby, Inc. All rights reserved.



HTO (High Tibia Osteotomy)

Transplantation of chondrocyts

- Under the microscope the appearance of the **replace med cartilage** is very similar to the original cartilage



Meniscus transplantation.

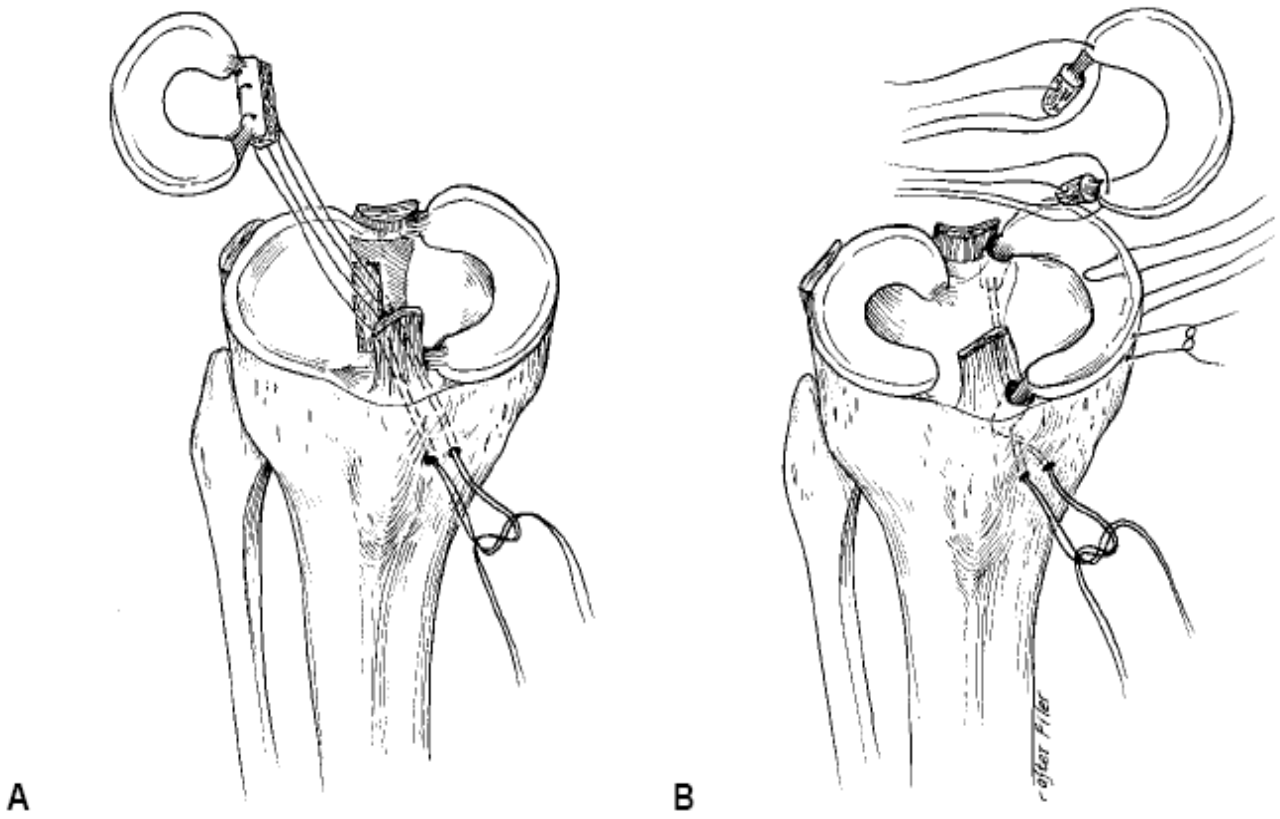
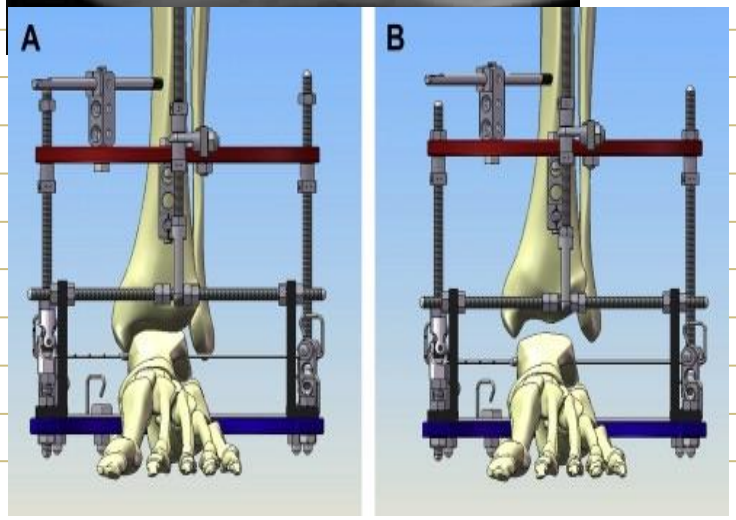
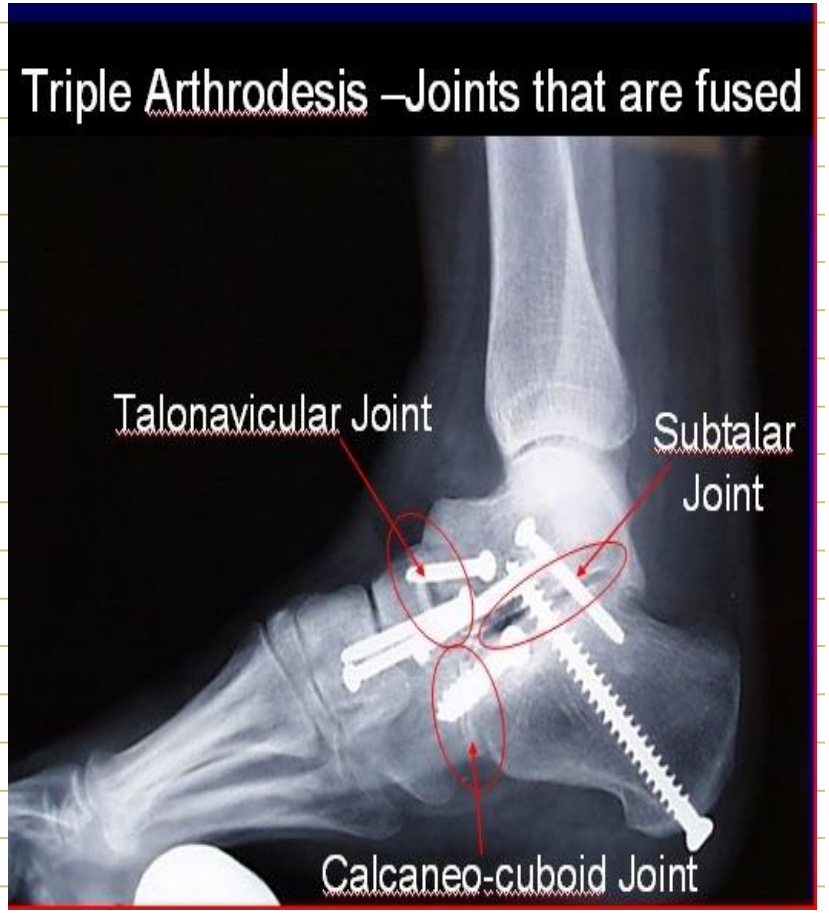


Fig. 6 Placement of prepared meniscus allograft. **A**, Lateral meniscus based on a bone block maintains the close proximity of the anterior and posterior horns. **B**, Medial meniscus based on separate bone plugs.

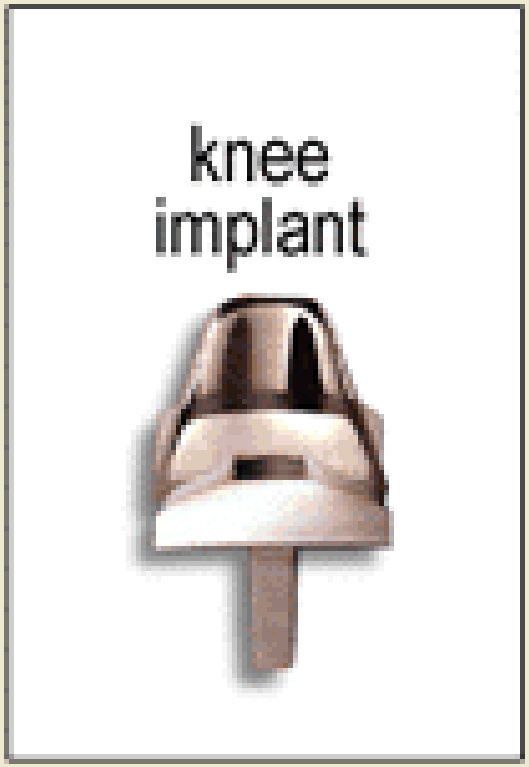
Arthrodesis

Arthrodesis



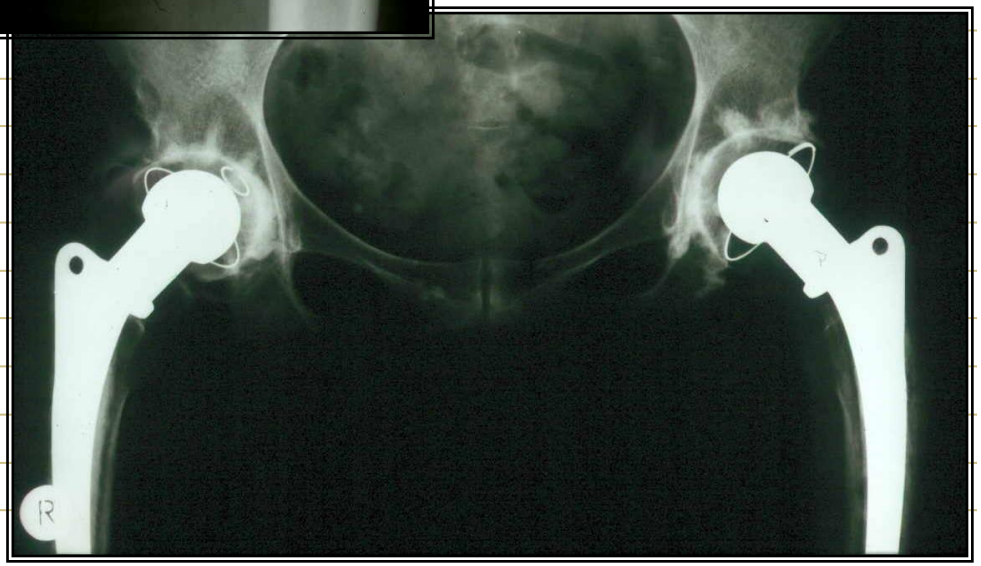


Artificial Joints

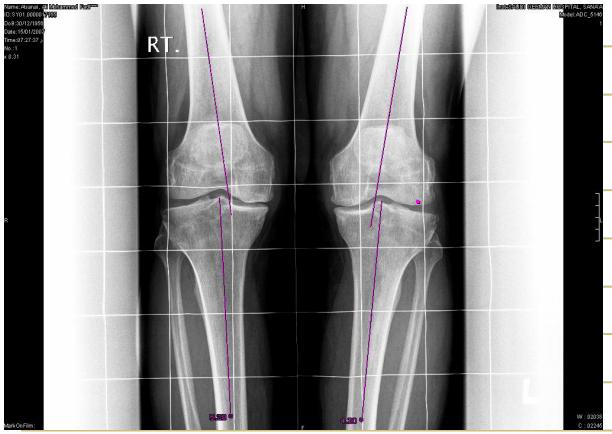


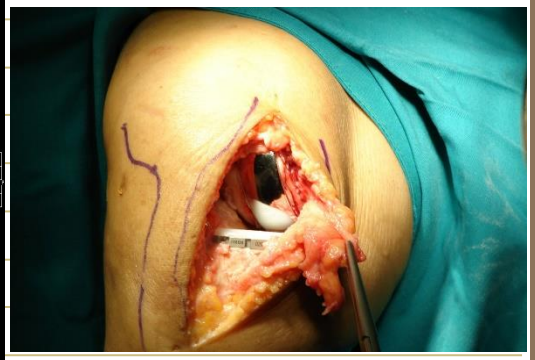
Artificial Hip Joint

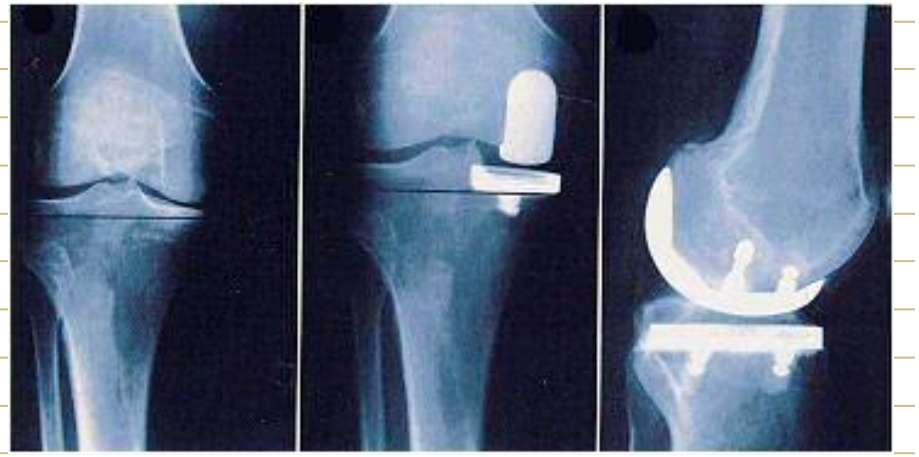
THR – Total Hip Replacement



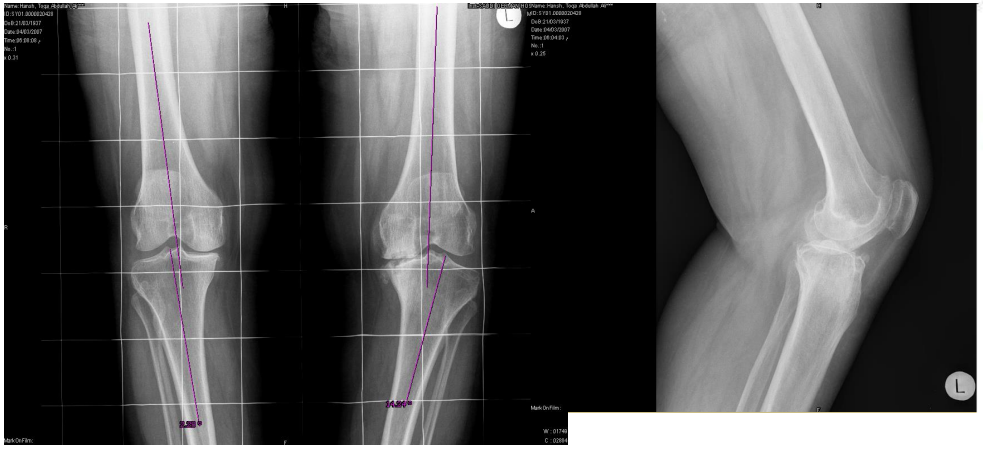
Uni compartmental (Hemi)TKR



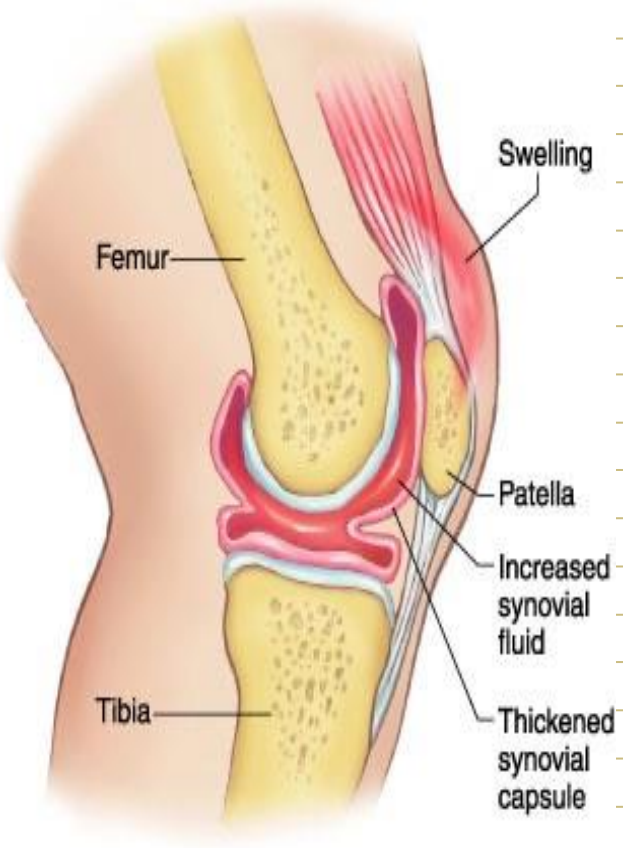


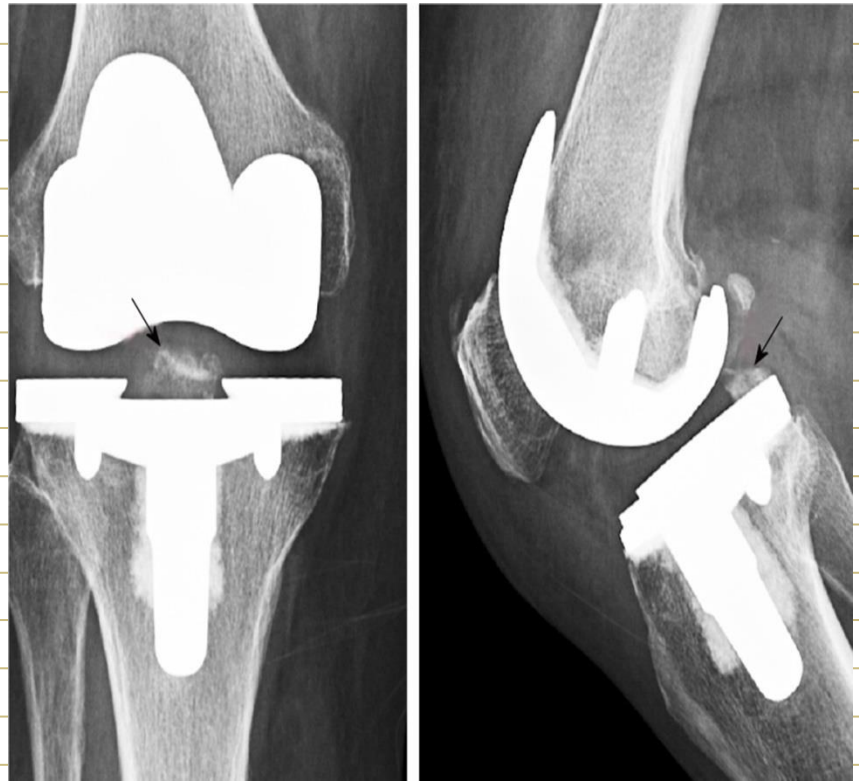


Bicondylar Surface TKR

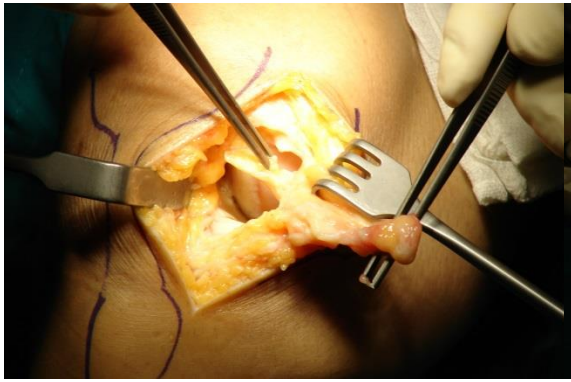
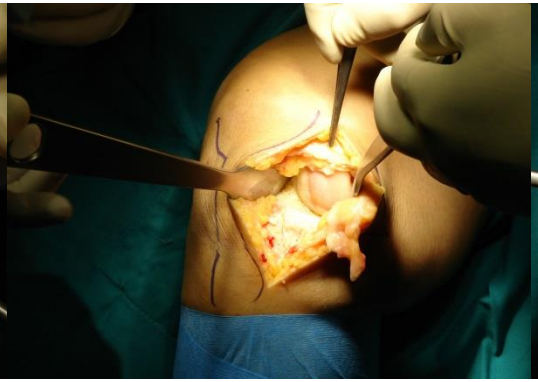
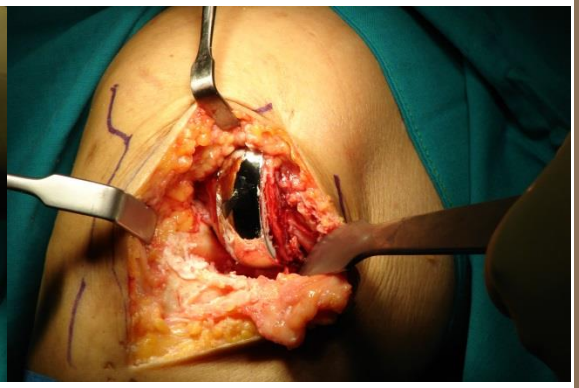
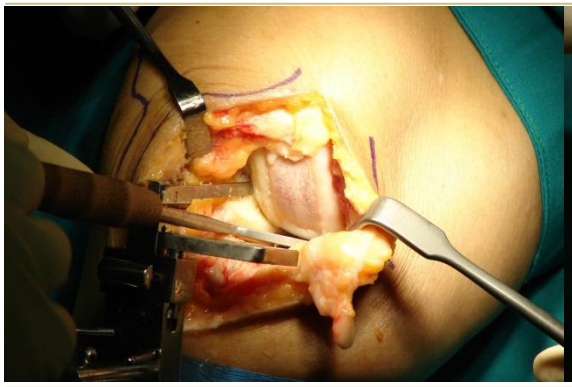


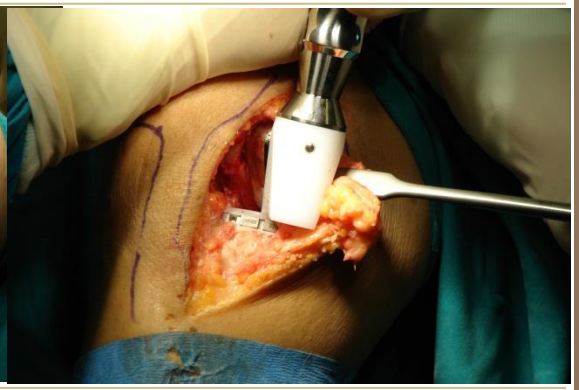
A.D.A.M.


Swelling
Femur
Patella
Increased synovial fluid
Tibia
Thickened synovial capsule

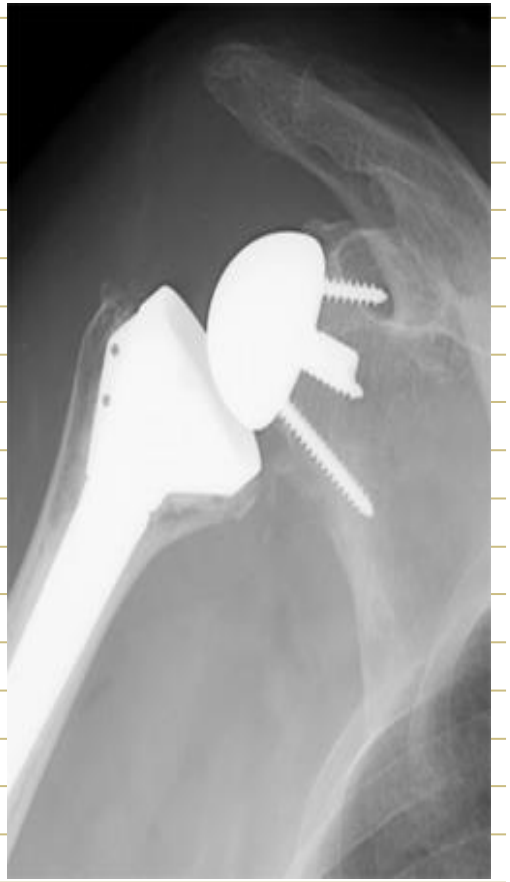


Bicondylar Surface TKR

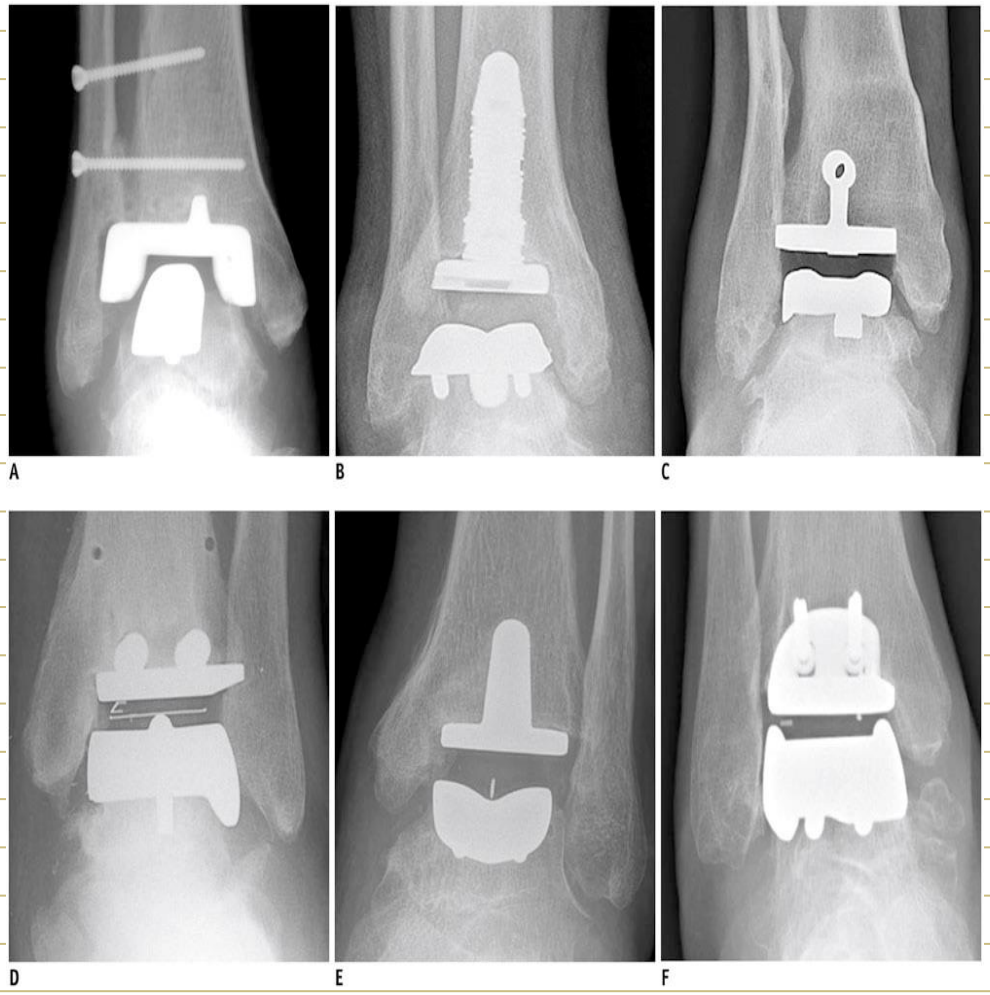


Artificial Shoulder Joints

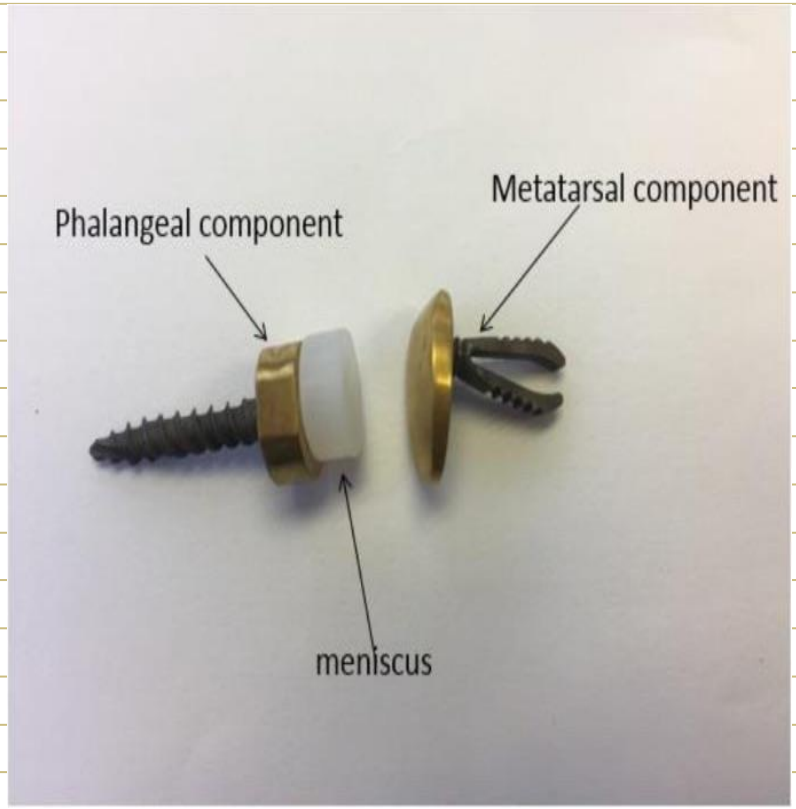


Artificial Elbow Joints

Artificial Ankle Joints



Artificial Inter-Phargial Joints



The best advice for Osteoarthritis

- ✓ Treating Osteoarthritis
- ✓ Regular Exercise.
- ✓ Losing Weight.
- ✓ Wearing suitable foot-wear.
- ✓ Using special devices to reduce the strain on joints during everyday activities.
- ✓ Being active is good for keeping joints healthy.

Osteoarthritis- !THINK! Function

Thank you

تم بحمد الله

سبحانك اللهم وبحمدك نشهد ان
لا اله إلا انت نستغفرك ونتوب اليك